



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

The Collecting, Drying and Mounting of Plant Specimens.

BY J. LUNELL.

Botanical manuals usually furnish ample and excellent advice how to prepare plants intended for permanent preservation, and my only excuse for what some would consider wasting printer's ink on this topic is that I wish to emphasize a few points which hitherto perhaps have not attracted the widespread attention they no doubt deserve.

The living plant is directly a production of nature, but a herbarium specimen is natural only in a modified form, and partly an art production. It is well to look at this matter from an esthetical point of view. Nature is always beautiful, even in disease, decay and death. An art production of a plant, be it the very plant or an imitation of it in clay or paint, becomes the more valuable the nearer it comes to its natural living model. In order to reach our goal, the end of all our efforts should therefore be to retain unchanged the likeness of the living plant. Botanists with a congenital sense for art as a rule produce acceptable plant specimens. By care and study they will effect approach to perfection. It is worth mentioning on the other hand that a not inconsiderable class of botanists indulges in the cynical habit of amassing material, no matter if it is good or poor, perhaps not even realizing the difference in qualities; we would feel inclined to call this special brand of botanists *plant butchers*. The large herbaria have an aim to pile up rich and varying material for the furtherance of scientific study, and beauty seems for the most part only to be a secondary matter with them.

Herborizing or Collecting. It is important to select beautiful and well developed plants, neither too large nor too small, and by all means to avoid thick and bulky material. Efforts should be made to secure entire subterranean parts, shoots, etc. Some writers advise the collection of three small plants or of two middle-sized to make up a specimen. The correct way is, I think, to collect enough for filling the sheet, but never to crowd it. The number of plants is immaterial. For large herbs, shrubs and trees the same rule holds. From the important parts enough is secured to fill the sheet (or sheets, if necessary). The connection between a parasitical plant and its host should not be severed. Night-blooming

plants, like some *Silene*, *Anogra*, etc., ought to be collected whenever the flowers are open: have a portfolio with bibulous paper ready, and expand the plants quickly between the sheets, applying the needed pressure immediately. This method ought to be used always when plants are inclined to collapse as soon as they are separated from the ground. Delicate parts can thus be satisfactorily and sufficiently expanded at once, when it would require hours to disentangle them when collapsed, for example *Capnoides*, *Papilionaceae*, etc., especially their leaves. To make the petals of *Alisma subcordatum* Raf. discernible after drying, one must insert them carefully between the sheets in the portfolio and apply considerable pressure *before* digging the plant out of the ground. Aquatic plants have to be spread out on paper beneath the surface of the water. To grasses the fibrous root-system is indispensable and ought always to be exhumed, as the separated parts are very undesirable and unseemly. If the collector is a poor swimmer, especially below water, and the water is deep, it is perhaps recommendable to employ a proxy for digging our deep-water plants from the bottom. Dioicous plants ought to be represented by staminate and pistillate aments, and in *Salices* the full-grown leaves, which appear with the winterbuds in the fall, will complete the specimen. Thick plants ought to be thinned with a knife.

The *drying* and *pressing*. Our aim is here to eliminate the third dimension as completely as possible, and the pressure applied merely ought to be short of crushing the parts. The plants already resting in the portfolio ought to be moved with their enveloping sheets into the press, and faulty arrangements, as doubled leaves, petals unsymmetrically disposed, etc., corrected. Plants from the collecting box have to be placed on sheets of paper, and all parts expanded and arranged *lege artis* in free-standing positions, so that no part is resting on and hiding another. Roots, stems, etc., have to be pared with a knife, in order to equalize the thickness of the specimen through all its parts as much as possible. When the length of the plant exceeds the length of the sheet, the stem has to be bent in an angle not in a curve, this bending to be repeated as many times as needed. In folding, the legs of the angle should come in the same plane, and the legs not allowed to rest one on top of the other at their junction and thus get their thickness doubled. With tall plants commence at a lower corner of the sheet and at the root of the plant, proceed to the upper corner on the same

side, make the bend, and so on. Do not forget to bring in view in the first place parts presenting the differential characters of the species. See that a fastigiate branch has its proper direction when leaving the stem, as well as a divergent one. Do not allow a left hand branch to cross the stem and crowd the right hand ones, and vice versa. This would increase the bulk on the usually thickest part of the plant above the ground. As hinted at above, an ideal arrangement will equalize the thickness over all parts of the specimen.

Dispose all parts artfully. The lower side of a leaf ought to be turned up, in order to demonstrate the appearance of this side. When leaves have to be in contact with stem or branches or floral parts, do always place the latter on top of the leaves.

Plants with thick, juicy leaves like most *orchids* or *Crassulaceae* ought to receive a hasty immersion in boiling water (for 30–60 seconds or longer), and some common salt added to the water will brighten the green color. The steaming of the parts is perhaps a preferable method. Whichever process is used, the flowering parts ought to be protected from the treatment.

Use paper capable of absorbing an excess of moisture, change it often and dry in the sun or in an oven. In the southern states it is usual to expose the press to the sun and the hot sand, which usually make a perfect work in the course of a day, but in most of the other states such a method would be insufficient and would, completely spoil the specimens, if these were left without further attention in the press until dry. The neglect of changing paper gives to the plants a resemblance of hay repeatedly soaked by rain and turns them black at last. It is good that so many plants contain such a moderate amount of moisture and thus are able "to press themselves," if they only are thrown between two papers and get a weight on them. Such plants are the redeeming feature in many herbaria which else would be considered beyond help in the eyes of the lover of the beautiful.

A good specimen is apt to stay permanently with its first receiver. An ugly one has often a future of extensive travelling not seldom sailing around the world a few times, everywhere creating disgust, dissatisfaction and disappointment. It would be of doubtful benefit even to have fine or jail sentences imposed on its progenitor, in order to check such a criminal tendency. It may cause a sensation of ease and relief to its temporary possessor, when it

has been successfully unloaded on some innocent victim. Incessantly on the tramp, it falls usually at last into the hands of some merciful, true philanthropist, who, out of compassion with suffering humanity, cremates it, hoping that from its ashes shall rise some new lovable form of life.

The *mounting*. Affix the plant to the herbarium paper by means of narrow strips of surgeon's silk plaster or of Japanese glued paper. To apply glue directly to the plant and make it adhere permanently to its supporting sheet is not commendable. Plants ought to be fastened so that they can be easily removed and their places filled with better specimens whenever such occasions offer themselves. Let it always be your aim with the mounting to cover the entire surface of the sheet, no matter how many individual plants are needed. My specimen of *Cerastium nutans* contains 24 plants, of *Centunculus minimus* 36. One or two, or even eight or ten plants on a sheet give the impression of loneliness and poverty, when 21 is the right number. Our enemies, the Germans, appreciate filled sheets in their own peculiar expression when they ask for exchange sheets *wohl aufgelegt*. Empty places, not otherwise fillable, could be occupied advantageously by single flowers, which will often display themselves gorgeously, but this suggestion ought not to be made use of too often, as everything becomes tiresome when overdone.

A trashy heap of disgusting material can often be made over and remarkably improved by steaming, which enables us to unfold the parts, straighten them out and mount them successfully.

Whenever feasible, place the thicker parts near the sheet margins with the widest possible variety of locations: one root in the left upper corner, another one an inch or more lower down on the left margin beneath, etc., in order to give to the piled sheets an equal thickness centrally, peripherally and all through. By this method and by avoidance of bulk in all forms within your power, there results a remarkable saving in space. And space is valuable indeed. At least it ought not to be squandered in order to make plant specimens ill-looking. I sent out once an exchange package of 100 specimens having a thickness in all its parts of 2 inches. The return package, also of 100 specimens, measured 7 inches in the medium line and 2 inches on the margins, and the pile resembled the vault of a gothic dome.

An all-important matter is also the symmetrical disposition

of the plants on their sheets according to the laws of the beautiful. The writer used for years to exchange with a renowned institution. Its plants were widely above reproach and of the most desirable quality. I made their mounting esthetically correct, and the result was a set of specimens unsurpassed and perhaps unequalled by any other set of its ilk in the whole world. Later it was my good luck to acquire a set mounted at home before it left the institution. The preparation of the plants themselves evidently showed the master's hand, but their arrangement on the sheets was unexpectedly and astonishingly faulty. In a number of instances they had been crowded in the corner of the sheet, many of them were laid in a pile and held in place by a strip of plaster like a bouquet of flowers, and other specimens had their peripheral parts extending outside of the sheet margins, leaving them utterly unprotected against mechanical injuries. The mounting hand had not been governed by a spirit impressed with a sense for the beautiful.

Three decades of building up an herbarium have been fruitful to me with varied experiences. When exchanging I used to suggest to my correspondents three rules: (1) The specimens ought to retain their natural colors as truly as possible; (2) they ought to have all the parts laid out and expanded with a painstaking accuracy; and (3) the sheets ought to be filled. Most responded lavishly, and some even sent me more beautiful specimens than they kept for their own herbaria. A few persisted tenaciously in transmitting poor material, and as a last resort I returned to them specimens prepared according to their own methods. This helped, and at last I had all "trained." All had only acceptable material to offer me.

Poor specimens were kept by me only temporarily, until I had acquired better ones, and I exchanged certain plants dozens of times until I finally had a good specimen of each.

The effects of these procedures on my herbarium are easily understood. There exist numerous herbaria exceeding mine in their numbers of specimens, but none outrivals or equals it in the beauty of the *entire* collection! In the heat of disputes I have often been called a "crank," but the opposition has always turned in my favor.

I trust that the reader of these lines will pardon me for expressing a deeper interest in aforesaid topics than he perhaps considers them deserving.

Leeds, North Dakota.